

# Household Migration, Remittances and Their Impact on Health in Indonesia

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## ABSTRACT

The growing flow of migrants' remittances has generated much interest in understanding the socio-economic consequences of household migration for individuals and families in migrant-sending areas. In this paper, I examine the effect of household migration on health status, as measured by nutritional status, of adults who have remained behind in rural Indonesia, a setting with a high rate of out-migration and poor nutritional profiles. Assuming that remittances may improve household economic resources and thus change dietary intake and health-related investment, household migration may be associated with the risks of both undernutrition and overnutrition. The analyses use longitudinal data from the Indonesian Family Life Survey and fixed-effect regressions. The results show that adults in emigrant households were significantly less susceptible to being underweight than those in non-migrant households, but that they did not have an increased risk of being overweight. The improved nutritional status was restricted to people in households with labour migrants, highlighting the role of remittances in improving nutritional intake. The health gain was also concentrated among women, increased with the number of out-migrants, and was revealed over time as remittances arrived. Overall, this study demonstrates the beneficial role of household migration, and especially the resulting remittances, in the health status of household members in resource-constrained settings. Improving transfers of remittances would be helpful in reducing the problem of undernutrition in poor migrant-sending areas.

## INTRODUCTION

Fueled by urbanization and globalization, migration has become an integral feature of family life in many parts of the world and is projected to accelerate in the coming decades (Lucas, 1997; Massey et al., 1998). Hundreds of millions of people in developing countries migrate to urban areas or emigrate to more developed countries in search of work and better living conditions. About 214 million people in developing nations live outside their home country, sending back over US\$180 billion (United Nations, 2009). Internal migration and remittances occur at even higher rates (IOM, 2005). While some migrants bring their families, most leave their family members behind because of the cost and uncertainty associated with migration (IOM, 2005). Therefore, most people touched by migration are not necessarily migrants themselves but those left behind.

In fully assessing the consequences of migration, a core element is to understand its impact on the remaining household members. Migration as a socio-economic process potentially confers economic benefits that result from remittances. Hence, the impact of migration is likely to extend to the family members left behind. There has been heated debate as to whether the impact of out-migration extends beyond short-term improvements in consumption to include longer-term socio-economic benefits, such as health status and various forms of health behaviour. This is reflected in the growing literature linking household migration with children's birth weight and mortality, women's reproductive health, and health utilization (Frank and Hummer, 2002; Hirsch et al., 2002; Hildebrandt and McKenzie, 2005;). Most of this existing work has focused on children and women left behind by as a result of international migration in Mexico. Hardly any studies have explicitly examined the consequences of internal migration or the effect of emigration on the nutritional

status of the adults left behind, a critical health measure that is closely related to morbidity and mortality.

In the present study, I examine the association between household migration and adult nutritional status in Indonesia, a country with a high rate of contemporary migration and a changing health landscape. In particular, malnutrition has remained a persistent public health concern in many parts of the developing world, including Indonesia (Flood, 1997; Muller and Krawinkel, 2005). In recent decades, the country has joined many other developing settings in a nutrition transition that is accompanied by lifestyle changes (unhealthy diet and reduced physical activity), with deleterious consequences for nutritional status (Caballero and Popkin, 2002). Such changes are especially significant among people with adequate resources. This pattern differs drastically from that in the developed world, where unhealthy forms of behaviours are negatively associated with socio-economic status. As a result, overweight and obesity have emerged as a health burden, mostly among the well off, in low-income countries (Popkin, 1998). This change has led to the coexistence of under- and overnutrition problems.

Because increased economic resources due to household migration tend to change lifestyles and the health-related investment, thereby having important implications for both of the nutritional problems discussed above, in the present study examines whether living in households with out-migrants is associated with lower risks of undernutrition (being underweight) and higher risks of overnutrition (being overweight) in Indonesia. To assess whether the observed difference is a result of remittances, in this study I distinguish households with labour migrants from those with other types of migrants, because remittances are generated largely from labour migration. I further explore the variations in

the relationship by the duration of out-migration, the number of migrants and the gender of those people left behind.

## CONSEQUENCES OF MIGRATION: FROM THE PERSPECTIVE OF SENDING AREAS

Migration has become a global phenomenon that is changing the lives of individuals and the structures of family units and societies. A number of theories have been developed in order to understand this phenomenon. The "new economics of labour migration" links migration and the families left behind (Stark and Bloom, 1985). This theory contends that migration decisions are made collectively by families in order to diversify risks and maximize household economic welfare, particularly in less-developed societies with inadequate credit systems and little institutionalized provision for insurance against crop failure, illness or loss of productivity in old age. Thus, families send some of their members out to work in wage labour while others tend the fields, generating surplus capital from the savings of the migrant workers. In this sense, remittances can play a crucial role in reducing the level of poverty, offering a strong potential for regional economic development (Adams, 2006).

Remittances are increasingly being shifted to centre stage as the most visible outcomes of emigration. This perspective is supported by many studies, which are finding that remittances have become a crucial source of family income in poor settings, accounting for up to 40 percent of household income (Rempel and Lobdell, 1978). Remittances serve as a family welfare system that smoothes consumption, alleviates liquidity constraints, and provides a form of mutual insurance. This has generated heated debate as to whether households increasingly spend remitted earnings on longer-term productive investments that may

contribute to poverty reduction and economic development, such as investment in health, human capital and entrepreneurship. Several studies document the role of remittances in promoting development by facilitating small business and agricultural investment (Woodruff and Zenteno, 2007). Others have argued that remittances are generally spent on consumption, limiting their long-term developmental consequences (Reichert, 1981).

### Household migration and health

Previous research on migration and health has largely concentrated on the health of migrants. Only recently have researchers begun to examine the health implications of migration for the people left behind, and most such research has focused on children. Kanaiaupuni and Donato (1999) find higher rates of infant mortality in Mexican communities with high levels of US migration, although this negative effect diminishes with the level of remittances. By contrast, other studies (Frank and Hummer, 2002; Hildebrandt and McKenzie, 2005) find a protective effect of migration in Mexico—children in households with emigrants have lower risks of low birth weight and child mortality.

There is growing, but still limited, evidence regarding the adult population. Kuhn (2005) examines the impact of adult children's migration on the health of their parents in a rural area of Bangladesh, showing a strong positive effect of adult children's migration on their parents' physical functioning and survival. The negative impact of migration is illustrated in a study on sexually transmitted diseases in rural India (Roy and Nangia, 2005). It shows that wives left behind report a higher prevalence of reproductive morbidity, which is considered to be a result of husbands' risky sexual behaviour at migratory destinations and wives' poor health-seeking behaviours in the place of origin.

The deleterious impact of household emigration has usually been perceived as a result of family disruption and reduced social support, which often carries detrimental consequences for psychosocial health. This is because the absence of family members probably increases the emotional burden and results in added stressors to compensate for the reduced labour supply needed at home. Nevertheless, the deleterious consequences may be cushioned by the economic and social transfers from migrants.

The positive impact of household migration is predominantly attributed to the substantial economic contributions of migration, which provide the remaining households with considerable financial advantages. These remittances can increase household consumption and improve aspects of living standards, such as sanitation, nutrition, and housing. They also can improve utilization of health services and other forms of health-seeking behaviours by directing more resources to health-related investments. In the long run, as migration becomes an integral feature of a community, it can lead to concomitant improvements in local infrastructure and promote local development that is conducive to good health (Taylor et al., 1996).

Beyond financial remittances, emigration can also bring about social transfers of knowledge, attitudes, and practices (Levitt, 1998), which may confer both benefits and costs on the well-being of the people left behind. Such transfers often take place as a result of migrants' exposure to multifaceted contexts, leading to a greater amount of available information; increased awareness of the benefits of nutrition, sanitation, and health care; and probably also a new set of lifestyles that are predominant at the places of destination. These social

remittances can have direct effects on health and also moderate the impact of monetary remittances.

## THE STUDY CONTEXT

Indonesia's high rate of contemporary migration and a changing health landscape make the country a compelling setting in which to study many questions related to migration and health. Indonesia is the fourth most populous nation with 234 million people. Over the past few decades, Indonesia has experienced rapid economic and social change. The country has also experienced concomitant improvements in access to health care and in common measures of health status, such as life expectancy and the infant mortality rate (Frankenberg and Thomas, 2000a). However, as a developing country, Indonesia still faces many health problems, including malnutrition and infectious diseases such as malaria and tuberculosis (WHO, 2002). The country's health profile has gradually changed following the nutrition transition. Modifications in diet and lifestyles have caused more people to become overweight, although this is not as prevalent as undernutrition and is mostly concentrated in the more developed urban areas (Flood, 1997). Overall, combating nutritional problems—both intractable undernutrition and emerging overnutrition—have become the national public health priorities.

Urbanization has occurred at a rapid pace in Indonesia. United Nations reports (2002) show that urbanization in the country has advanced substantially to over 40 percent in 2000, exceeding that of many other developing countries. The 2000 census reports that one in ten Indonesians can be classified as migrants (Hugo, 2000). The internal migrant stream is largely characterized by economically motivated migration. As is common throughout the



world, migrants are largely drawn from the young male population, although female migration has been increasing. Migrants often come from relatively less well-off households and generally take labour-intensive or service jobs. Due to the large rural-urban income gap, the earning advantage of migrants is evident. Indonesia is also one of the world's major sources of international migrant worker flows to the South-East Asian countries and the Middle East, sending a total of around 2.5 million immigrants (Hugo, 2002). But this migrant stream is small relative to the scale of internal migration.

Migrants maintain strong ties with their families and return periodically to their home areas. As in many other settings, Indonesian migrants remit a considerable proportion of their income to their families, usually once or twice a year (FDC, 2007; Hugo, 1982). These remittances have become an important source of income, with total remittances accounting for as much as 50 percent of the family income (Hugo, 1982). As documented in a case study in rural Java over 30 years, in the 1960s many families had very few sources of income; but now a large proportion have at least one person working outside the village (Collier et al., 1993). More precisely, in the late 1990s 25 percent of rural households in the country relied on labour migration and remittances (Hugo, 2002). The remittances were largely used to aid daily family needs.

## THE CURRENT STUDY

In this study, I examine the health consequences of household migration in Indonesia. On the positive side, the widely documented protective effect of economic resources against malnutrition (Gwatkin et al., 2000) highlights the importance of out-migration because it

often entails substantial economic improvement through remittances. They are likely to benefit those family members who are left behind by improving health-related investments such as nutritional intake and sanitation. These improvements, in turn, can reduce the risk of under-nutrition and infectious diseases. On the negative side, because in nutrition transition settings overnutrition has been largely observed among the well-off (Popkin, 1998), increased economic resources from remittances may lead to dietary change (such as more processed, sugary, high fat diets) and a sedentary lifestyle, which subsequently contributes to a higher risk of overnutrition. In a similar vein, the social transfers that accompany monetary remittances may also confer both benefits and costs on nutritional status. These social transfers from migrants working in more developed areas may increase people's awareness of the benefits of proper nutrition, sanitation and healthcare. However, they can also bring about unhealthy lifestyles as migrants adopt a new set of behaviours that are commonplace in host societies.

Overall, we expect that household migration may decrease the risk of undernutrition while increasing the risk of overnutrition. Because remittances are generated largely from labour migration, we expect the relationship to be driven by people in households with labour migrants.

We also expect differential effects by the duration of out-migration and the numbers of migrants. The influence of household migration may not be immediate but may be revealed over time as remittances arrive, and the impact tends to increase with the number of out-migrants as more migrants bring more remittances. Finally, there also may be some gender differences in the observed relationship. Because women are generally more likely to invest in their own health than men (Paringer, 1983), especially when they are empowered to manage resource allocation (which can happen when the male family member has migrated),

the association between household migration and nutritional status is likely to be stronger for women.

## DATA AND METHODS

The data used are from the 1997 and 2000 waves of the Indonesia Family Life Survey (IFLS), a longitudinal multi-stage probability sample survey that is representative of 83 percent of the national population. The first round (IFLS1) of the survey was conducted in 1993 and included interviews with 7,224 households and 22,347 individuals. In 1997, the IFLS2 was conducted to interview all IFLS1 households and respondents as well as all household members not interviewed in 1993 (Frankenberg and Thomas, 2000b). In 2000, the IFLS3 was conducted to re-interview all households and all respondents from previous rounds (Strauss et al., 2004). Considerable efforts were made to minimize attrition. The IFLS2 and IFLS3 included over 90 percent of the households and over 80 percent of the individuals from the previous waves. A high follow-up rate substantially reduces the concerns that can arise from selective attrition.

Professional interviewers were accompanied by trained nurses to collect a broad array of information in each wave about demographic and socioeconomic characteristics and histories, as well as aspects of health behaviours and health measurements including self-reported health and physical assessments such as weight and height. Importantly for the purpose of this study, the IFLS contained a detailed household roster with information about whether a member who lived in the household in previous waves had moved out and, if so, the main reason for that person's migration. The study described herein mainly used the

IFLS2 and IFLS3, because the measure of household migration was not available in the IFLS1.

### Measures

We used the body mass index (BMI), constructed from measures of height and weight, to assess adult nutritional status: underweight ( $\text{BMI} < 18.5 \text{ kg/m}^2$ ) indicated undernutrition and overweight ( $\text{BMI} \geq 25.0 \text{ kg/m}^2$ ) indicated overnutrition. These are the standard cut-offs defined by the World Health Organization.

The key explanatory variable was household migration status, which indicated whether someone from the household had migrated for work. This measure was constructed from the household rosters. Specifically, a member was considered a labour migrant if he or she was absent from the original household and was reported to have moved out for work-related reasons. While this procedure can capture most out-migrants, it may have underestimated highly circular migration and recent return migrants. A sensitivity analysis was conducted to take account of these migrants—who had moved back to the current household within 6 months of the interview—and this yielded highly consistent results. In general, the measure of household migration was successful at capturing households with emigrants, as the estimate was close to those reported in other studies (Hugo, 2002). Because internal migration occurs at a more extensive rate in Indonesia than international migration, the vast majority of the migrant households (over 90 percent) sent out internal migrants. This study did not distinguish between internal and international migrant households because of lack of sufficient information.

To better evaluate the role of remittances, we constructed a variable that distinguished among non-migrant households, households with labour migrants, and households with other types of migrants (for short visits, family-related reasons, marriage, education, etc.). To separate the immediate and the longer-term impacts of household migration, we created a discrete variable of length of out-migration that differentiated among non-migrant households, households with recent migrants (within 2 years) and households with longer-term migrants (> 2 years). We also constructed a continuous measure indicating the number of out-migrants in the household.

Other covariates included factors previously demonstrated to be important predictors of migration or nutritional status: age (both linear and quadratic age terms to capture nonlinear health trajectories); gender; years of schooling; current work status; logged per capita annual household income (the sum of the income of the current household members divided by the current household size); family structure; household size; female head of household; marital status; household economic shock (whether the household had experienced any economic shock in the past 5 years, such as unemployment of a household member, crop loss, household loss due to disasters, etc.); and province of residence.

## Analyses

The analytical sample consisted of adults in rural Indonesia because the vast majority of migrants originate from rural areas. The analysis was limited to people aged 18–65 to avoid bias due to differential mortality at older ages—age 65 was the life expectancy in Indonesia in the late 1990s. By definition, migrants themselves were eliminated to avoid confounding the effect of out-migration with that of a person’s own migration experience. In the sample,

the quantity of missing information was relatively small. Seven percent of cases had missing data and were deleted. The individual attrition rate between 1997 and 2000 was 18 percent. Because a large fraction of the people lost to follow-up were migrants (over 85 percent) and thus would not qualify for inclusion in the sample, concerns about selective attrition were greatly reduced. In addition, after controlling for demographic and socio-economic characteristics, nutritional status at the earlier wave is not associated with sample attrition. The final sample for analysis consisted of 6,012 people surveyed in IFLS2 and IFLS3. To study the differential effects by gender, stratified analysis for males and females were conducted.

We exploited the longitudinal structure of the data and used fixed-effects (or conditional) logistic regression models to estimate the likelihood of within person changes in nutritional status as a function of changes in explanatory variables, including household migration status (Wooldridge, 2002). The fixed-effects regression models essentially compared the same individuals over successive IFLS waves; that is, before and after out-migration took place. This approach helps adjust for the possibility that the effect of migration may be plagued by unobserved heterogeneity (as long as it is stable over time)—that is, unmeasured factors influencing migration decisions (i.e. previous life exposure, household socio-economic circumstances and personal traits) may also affect the health of household members. If such factors are not adequately controlled for and are negatively related to health (as is almost certainly the case), the regression results would be overstated. This was accomplished using conditional maximum likelihood estimation. The interpretation of the fixed-effects logistic models was similar to that for logistic regressions. A caveat was that time-invariant factors (i.e. gender) could not be explicitly modelled. The models also excluded individuals without outcome variations. This was not a major concern because the sample provided sufficient

variation to sustain the analysis. In all analyses, the Huber-White robust estimator was used to correct the standard errors for clustering of individuals within households (White, 1980). The analysis also accounted for potential bias from socio-economic shock external or internal—to the household that might have been an impetus for migration and might also have caused health problems. This was accomplished by controlling for province-level contextual effects and time-varying effects of macroeconomic shocks, as well as an indicator of household socio-economic shock.

## RESULTS

Table 1 presents the descriptive statistics separately for the IFLS2 and IFLS3 and by household migration status. In 1997, 16 percent of rural households had sent someone out for work. This fraction increased by almost 8 percent by 2000. Over half of the people surveyed were females and over 80 percent were currently married in both years. The results confirmed the low levels of education and earnings reported in earlier studies in rural Indonesia: half of the respondents had primary school education or less and an average per capita annual income of 1,250,000 Indonesian rupiah (roughly US\$150) in 1997, and this pattern remained the same in 2000. The results were also consistent with previous work showing that migrants are largely drawn from relatively poor households and households with some educated members. In addition, emigrant households are more likely to be extended in structure. This may be because extended households were more likely to have surplus labour and thus to send out migrants, or because when facing emigration, many families tend to adopt extended living arrangements as a coping strategy. With respect to nutritional status, in 1997 around 18 percent of the people surveyed were underweight and

this value remained stable over time. Importantly, the risk of being underweight was lower in emigrant households than in non-migrant households. On average, over 11 percent of the sample was overweight in 1997 and the fraction had increased to over 13 percent by 2000. Emigrant households seemed to experience a slightly lower risk of being overweight. Overall, the study regions witnessed an increasing burden of overnutrition, while undernutrition remained a dominant health issue. Nevertheless, these bivariate relationships in weight status should be interpreted with caution, because no adjustment was made for the considerable socio-economic differences between the emigrant- and non-emigrant households. I next provided a more accurate understanding using multivariate regressions.

[Table 1 about here]

Table 2 illustrates the relationship between household migration and nutritional status, adjusting for the possibility that people in migrant and non-migrant households differed on a wide array of characteristics. The results showed a negative association between household migration and underweight: adults in migrant households were significantly less likely to suffer from undernutrition than those in non-migrant households. The odds of being underweight dropped by more than 40 percent for adults in migrant households. Because a binary change in health indicates a substantial state transition, this result illustrated the beneficial role of migration for nutritional status. In contrast, household migration was not related to overweight. The odds ratio was indistinguishable from 1 and was insignificant. Thus, during the 3-year study period, there was no clear evidence of a lifestyle change associated with migration that might increase the risk of overweight. The result was the same when we distinguished among different types of household migration and stratified the data by gender. Thus, the subsequent analysis focused on the problem of undernutrition.



[Table 2 about here]

In Table 3, we first differentiated labour migrant households from other types of households. The observed relationship was largely driven by adults in households with labour migrants. In other types of non-labour migrant households, the effect of migration was small and insignificant. This finding lent support to the premise that remittances, and consequently improved living standards such as food intake, underlie the association between migration and nutritional status. In contrast, in households where people migrated for social reasons, the people left behind did not receive the economic contribution of migrants and may even have experienced income declines due to the reduction in available household labour. With respect to the length of migration, the nutritional benefits of household migration were not immediate but appeared to accumulate over time. Within the first 2 years of out-migration the relationship was in the expected direction, but only marginally significant. This was presumably because households received little or no remittances immediately after out-migration, as migrants were still struggling to find work and repay debts incurred during migration. This was especially true in the first year after migration: the relationship was insignificant (95 percent CI of OR is [0.305, 2.609]). Over a longer period of time, the impact of migration on undernutrition became more evident as remittances grew over the course of migrants' settlement in their host societies and began to shape household living standards. In addition, when the household has multiple out-migrants, the positive effect of emigration is amplified. This is what we would expect because multiple migrants can lead to more sources of transfers.

[Table 3 about here]

The analysis also pointed to noticeable gender differences. Women were especially likely to take advantage of remittances, as the benefit with respect to nutritional status was mostly evident in females. This result confirmed the hypothesis that women were more likely to allocate more resources to health and nutrition than men.

## DISCUSSION

This research demonstrated the important implications of migration, as an institutionalized household strategy adopted in many resource-constrained areas, for the well-being of individuals who remained behind in migrant-sending communities. To our knowledge, this is the first study to evaluate the association between household migration and the nutritional status of adults in developing countries. The study showed that the economic benefits of remittances play a beneficial role in reducing the risk of underweight in resource-poor areas such as rural Indonesia. The increased economic resources translated into health benefits because they improved the household standard of living, which is conducive to good nutritional status (e.g. food consumption, sanitation, and health investment). Because remittances represented the core mechanism for the observed health improvements and they took time to arrive, the observed relationship was detected mostly in households with labour migrants and on a longer time scale, and it increased with the number of out-migrants. The relationship was negligible for people left behind by non-labour migrants and immediately after emigration, in particular within the first year of out-migration. This study also revealed

the moderating role of gender, with women more likely to secure nutritional benefits from out-migration. This was presumably a result of women's greater propensity to invest in health, especially when they are left behind and thus empowered to manage resource allocation. We further examined the potential role of migration in changing the lifestyles of family members left behind and thereby increasing the risk for overweight. The results did not support this possibility.

The findings add to the literature on the consequences of migration by showing that its influence can extend to migrant-sending areas and beyond economic improvements to individual well-being such as health status. This research also showed that the role of migration on health, which has largely been documented in the context of Mexico–United States migration, generalizes to other developing countries with a high rate of migration. The process of migration can thus be understood partly as a socio-economic process that provides households with economic advantages, which subsequently translate into health benefits.

Several limitations of this study warrant discussion. It would be informative to explicitly examine the flow and use of remittances. Unfortunately, although the dataset was good in many respects, it did not supply such information. The study also cannot disentangle the specific relationships between individuals who are left behind and migrants due to inadequate information. Thus, the results should be interpreted as average rather than relation-specific patterns. The analysis also lacked sufficient information and power to examine the similarities and differences in internal and international migration. The generalizability of the results to other settings may also be restricted, as discussed in more detail below.

Despite these limitations, the finding that migration constituted a nontrivial determinant of adult nutritional status should be of general interest to the research and policy communities, as migration has become an integral feature of family life in many parts of the world. Given that migration can have positive health consequences, especially for people in resource-poor settings, programmes that promote economic transfers from migrants by addressing the means and the costs of transfers would be effective in reducing undernutrition. One strategy is to boost the amount, regularity and prompt receipt of remittances by diversifying the available transfer methods and reducing transfer the costs. This would be especially helpful in reducing problems of undernutrition in poor migrant-sending areas and improving the overall well-being for people in these contexts. Also, the extent to which health benefits occur probably depends on the efforts to help migrant families make the best use of these resources to sustain welfare and growth promotion. Recipient families would thus benefit from programmes that promote productive investment of remittances.

The findings in this study certainly do not suggest that household migration is free of adverse consequences. The absence of key family members may incur emotional costs and lead to decreased social support, which can have detrimental impacts on psychosocial health. In addition, although the study did not find a relationship between household migration and overweight, the results should not be taken as evidence that it is not a valid concern. The relatively short time lag between 1997 and 2000 permitted us to study the short-term consequences of migration. Over the long term, we may observe some different patterns that are contingent on social and economic transfers over time. With a longer time series, it may also become possible to determine whether concomitant changes in lifestyles and other forms of health-related behaviour occur, as behavioral change often requires an extended period of time to become visible.

It should be noted that the findings may not be generalized in their entirety to other migrant-sending areas, as the influence of household migration may very well be contextualized within the larger sociocultural sphere within which migration occurs. While the story told here is part of a broader picture of how migration and remittances have become ingrained in family life and have helped reshape individual well-being, the different health landscapes, developmental stages, and institutional systems across settings probably mean that a different set of conditions and varying levels and uses of economic transfers exist in different locales. While the Indonesian case mostly involves migration within a country, it has international implications. The experience of family members of cross-border migrants, especially those who go to industrialized countries, is probably intensified given the higher levels of remittances from international migrants and the health profiles of destination countries, many of which have overnutrition as a common health concern. A comparative perspective would greatly advance our understanding of migration and remittances in shaping the well-being of individuals and families.

NOTE

1. Household migration is defined as out-migration of one or more household members.

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# TABLES

Table 1. Sample Descriptive Statistics, by Household Migration and Year: Indonesian Family Life Survey (IFLS) 1997-2000.

Variables	1997		2000	
	Non-emigrant households	Emigrant households	Non-emigrant households	Emigrant households
Age	40.2	44.0	43.0	46.7
Male (%)	46.5	43.7	46.7	44.7
Currently working (%)	66.9	66.1	80.3	80.1
Education in years (%)				
0-5	54.4	52.8	54.6	53.2
6-9	35.2	35.9	34.8	38.8
$\geq 10$	10.4	11.9	10.6	8.1
Marital status (%)				
Never married	10.3	12.3	8.5	7.8
Married, living with spouse	79.2	69.5	79.1	79.1
Married, not living with spouse	1.5	6.2	1.3	1.4
Marriage dissolution	8.9	12.0	11.0	11.7
Per capita HH annual income (in Rupiah) <sup>a</sup>	1,287,685	1,055,480	1,433,105	1,339,350
Family structure (%)				
Nuclear	63.5	59.5	62.5	54.1
Extended	34.9	39.4	35.6	44.5
Other	1.6	1.1	2.0	1.4
Female-head HH (%)	10.6	16.3	10.5	15.4
HH socioeconomic shocks in past 5 yrs (%)	46.0	44.5	41.5	39.8
HH size	4.4	4.6	4.8	5.0
Underweight (%)	18.6	17.9	18.5	17.2
Overweight (%)	11.4	10.5	13.5	12.6
<i>N (individual)</i>	5,044	968	4,575	1,437

<sup>a</sup> The variables are adjusted for inflation (in thousands of constant 2000 Indonesian Rupiah). In 2000, 1 US dollar = 8,290 Indonesian Rupiah.

Table 2. Odds Ratios for Underweight and Overweight on Covariates, IFLS 1997-2000.

	Underweight OR (95% CI)	Overweight OR (95% CI)
HH with labor migrants <sup>a</sup>	0.576** (0.378, 0.878)	0.989 (0.559, 1.750)
Age	0.734** (0.598, 0.903)	1.388* (1.033, 1.865)
Age squared	1.003** (1.001, 1.005)	0.996* (0.992, 0.999)
Currently working	0.629* (0.435, 0.910)	0.120 (0.704, 1.783)
Education <sup>b</sup>		
6-9 years	1.074 (0.615, 1.874)	1.293 (0.570, 2.933)
≥10 years	0.322 (0.322, 5.910)	0.604 (0.176, 2.066)
Marital status <sup>c</sup>		
Married, living with spouse	1.936 (0.568, 6.603)	2.379*** (1.877, 3.016)
Married, not living with spouse	1.359 (0.291, 6.336)	0.420 (0.026, 6.854)
Marriage dissolution	0.814 (0.172, 3.847)	2.281** (1.224, 4.250)
Per capita HH annual income (log)	0.991 (0.955, 1.029)	1.034 (0.990, 1.080)
Family structure <sup>d</sup>		
Extended families	1.066 (0.692, 1.641)	1.671 (0.876, 3.186)
Other	2.289 (0.601, 8.718)	3.609 (0.323, 40.292)
HH size	1.176 (0.950, 1.455)	1.249 (0.915, 1.707)
Female-head HH	2.708* (1.031, 7.108)	0.604 (0.176, 2.065)
HH economic shocks in past 5 years	1.279 (0.970, 1.688)	1.438 (0.999, 2.072)

*Note.* OR = odds ratio; CI = confidence interval. Estimates for year, province dummy variables, and their interactions are not shown. Estimate for sex is dropped in conditional logistic regressions.

<sup>a</sup> The reference category is non-migrant households.

<sup>b</sup> The reference category is 0-5 years.

<sup>c</sup> The reference category is never married.

<sup>d</sup> The reference category is nuclear families.

\*\*\*  $p$  value < 0.001; \*\*  $p$  value < 0.01; \*  $p$  value < 0.05.

Table 3. Odds Ratios for Underweight on Types of Household Migration, Length of Migration, and by Sex, IFLS 1997-2000.

	Underweight OR (95% CI)
Types of migrants <sup>a</sup>	
HH with labor migrants	0.512* (0.295, 0.889)
HH with other types of migrants	1.075 (0.679, 1.700)
Length of absence <sup>a</sup>	
HH with labor migrants ≤2 year	0.621+ (0.364, 1.059)
HH with labor migrants >2 year	0.501* (0.283, 0.885)
Number of out-migrants	0.710* (0.509, 0.990)
Women	
HH with labor migrants <sup>a</sup>	0.522* (0.286, 0.951)
Men	
HH with labor migrants <sup>a</sup>	0.704 (0.351, 1.413)

*Note:* OR = odds ratio; CI = confidence interval. Estimates of other covariates are not shown, which are the same as those presented in table 2.

<sup>a</sup> The reference category is non-migrant households.

\*  $p$  value < 0.05; +  $p$  value < 0.1.